# BOOK REVIEWS

Markus Riederer and Caroline Muller (eds.). 2006. **Annual Plant Reviews, Volume 23: Biology of the Plant Cuticle.** (ISBN 1-4051-3628-X, hbk.). Blackwell Publishing. 2121 State Ave., Ames, IA 50014-8300, U.S.A. and 9600 Garsington Road, Oxford, OX4 2DQ, UK. (**Orders:** www.blackwellprofessional.com, orders@ames.blackwellpublishing.com, 515-292-0140, 515-292-3348 fax, 1-800-862-6657). $249.99 hbk., 438 pp., 6¼" × 9½".

This is another installment from Blackwell Publishing's noteworthy Annual Plant Review Series. As always, it includes chapters on the latest research on its subject written by experts in the field. This volume examines the biology of the plant cuticle in depth. The first chapter is an introduction written by one the book's editors: Professor Markus Riederer of the Julius-von-Sachs Institute in Wurzburg, Germany. Dr. Riederer opens with an interesting question put to him by a University search committee: "Does it make sense, and is it fun at all, to spend so much time with the outermost micrometer of a plant?" Dr. Riederer replies, "…it is fun indeed to study the plant cuticle and the plethora of processes related to it." He goes on to state that it is his hope and that of the volume's contributors that readers "…will find that it is worthwhile to invest time, brains and funds into this endeavor."

The plant cuticle is a continuous membrane covering a plant's surface that is composed of waxes and other extracellular substances. The plant cuticle has been an essential component of plant structure for millennia. The oldest cuticle found dates back to the late Silurian and early Devonian periods, about 400 million years ago. It protects plants from ultraviolet (UV) radiation and pathogens like fungi, and it can even control the behavior of hungry herbivores. The cuticle controls transpiration in cooperation with the stomata by preventing water loss. The importance of this function, especially in xeric environments, is obvious. In addition to preventing water loss, the cuticle protects the plant by preventing rainwater and its microbes and unwanted molecules from passing into the plant. Some cuticles even cause microbes, dust, and other small molecules to be removed along with the rainwater in a process known poetically as the Lotus effect. The resistant cuticle also prevents the loss and uptake of polar molecules like salts through the plant's surface, and controls the uptake of organic compounds, including environmental pollutants. During the time when the stomata are closed, the cuticle assumes complete control over the exchange of gases and vapors through the plant-atmosphere interface. In addition, the cuticle often provides important structural support to the plant, an essential factor in the dreaded tomato fruit cracking familiar to farmers and gardeners.

Some 2,300 publications about the plant cuticle have been published in the last ten years according to the database BIOSIS. This is the first experiment-based comprehensive scientific book devoted the plant cuticle since the 1970's that is not a compilation of conference proceedings. Many developments are covered, including new research on cuticular wax composition and biosynthesis, quantitative assessment of the transport of lipophilic organic compounds across the cuticle, and the cuticle's role in UV protection. Scientists have discovered new roles for the cuticle, including a role in pollen stigma-interactions. The cuticle's role in regulating interactions between plants and their environment is of interest to ecologists, environmental scientists, entomologists, and phytopathologists. In addition, practical information for horticultural and agricultural scientists is in included. This volume is excellent and long overdue source of information about the current research on the plant cuticle.—*Marissa N. Oppel, MS, Collections and Research Assistant, Botanical Research Institute of Texas, Fort Worth, TX, 76102-4060, U.S.A.*

Kent J. Bradford and Hiroyuki Nonogaki (eds.). 2007. **Annual Plant Reviews, Volume 27: Seed Development, Dormancy, and Germination.** (ISBN 1-4051-3983-8, hbk.). Blackwell Publishing. 2121 State Ave., Ames, IA 50014-8300, U.S.A. and 9600 Garsington Road, Oxford, OX4 2DQ, UK. (**Orders:** www.blackwellprofessional.com, orders@ames.blackwellpublishing.com, 515-292-0140, 515-292-3348 fax, 1-800-862-6657). $199.99, 367 pp., 6¼" × 9½".

Seeds are not only vital to the life cycles of gymnosperms and angiosperms, they are also important staples in the human diet. The 27th volume of Blackwell Publishing's Annual Plant Reviews covers "seed biology from the point of view of the developmental and regulatory processes that are involved in the transition from a developing seed through dormancy and into germination and seedling growth." Ten years have passed since a book on this subject has been published, and there have been many advances in this field of research. The model system *Arabidopsis thaliana* has been the subject of much recent research and is featured prominently throughout this book and on its cover. The first two chapters cover the genetic control of seed development, including seed mass and seed coat development and dormancy. These chapters are followed by six chapters devoted to seed dormancy, including seed dormancy models, genetic aspects, lipid metabolism, and the roles of nitric oxide and abscisic acid. The final four chapters are focused on seed development and germination, including the roles of the abscisic acid and the gibberellins and the mechanisms, regulation, and genes involved in germination and the transition to seedling growth. The "current challenges and remaining questions for future research" are discussed, as well. This book is a resource for seed biologists, plant breeders, geneticists, plant developmental biologists, and graduate students.—*Marissa N. Oppel, MS, Irving, Texas, U.S.A.*